REMARKS

Applicants request favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 1 and 3-16 are pending in the application, with claim 1 and 10 being independent and presently under consideration.

Claim 2 has been cancelled. The limitations of Claim 2 have been incorporated into Claim 1. By this Amendment, Applicants have amended claims 1 and 10. No new matter has been added.

Applicants request favorable reconsideration and withdrawal of the rejections set forth in the outstanding Office Action.

In the Office Action, Claim1-16 were rejected under 35 U.S.C. § 102(b) as being anticipated by Fukui et al. (US 4,630,849). Those rejections are respectfully traversed in light of the preceding amendments and the following remarks.

Applicants wish to point out that Claim 1 now emphasizes that the pipe segment is of metal with both a central portion and a threaded portion (with a surface roughness of between 2,0 and 6,0 microns) that is covered with a surface protection that is constituted of two uniform layers – the first layer over the metal being of a dry corrosion inhibiting coating that further comprises an epoxy resin containing particles of Zn, with that first uniform layer then being covered by a second uniform layer of dry lubricant.

Applicants also wish to point out that Claim 10 now emphasizes that a threaded end portion is covered with a surface protection, characterised in that the metal surface of the threaded end portion has a surface roughness (Ra) comprised between 2,0 microns and 6,0 microns, and said surface protection is constituted by one uniform layer made of a dry corrosion inhibiting coating containing a

dispersion of particles of solid lubricant. Therefore, the embodiment of claim 10 relates to a "one-layer coating" where a dispersion of lubricant particles is a discontinuous phase within a continuous phase of a dry corrosion inhibiting coating, such as an epoxy resin, thus functioning as the double layer coating of the embodiment of claim 1.

It is respectfully submitted that Fukui et al. does not anticipate that combination of structure, as positively recited in each of independent claims 1 and 10.

Applicants will now highlight certain claim limitations, and why Fukui et al. neither anticipates nor renders obvious the combinations of independent claims 1 and 10.

The Surface Of The Threaded End Portion Has Surface Roughness Of 2,0 To 6,0 Microns

Fukui et al. discloses such value of surface roughness only in an embodiment which requires a metal plating, i.e. in the examples to which Tables 1 to 5 refer. However, such values of surface roughness are not in the Table 6, which refer to a resin coating. There is no basis to conclude that a worker of ordinary skill would understand Fukui et al. to be teaching use of a specific surface roughness value, as might be required specifically for applying a metal plating, upon a surface to which an epoxy resin coating will be adhered to, as required by claim1. There is also no basis to conclude that a worker of ordinary skill would understand Fukui et al. to be teaching use of a specific surface roughness value, for a combined layer of a corrosion protection phase with a dry lubricant dispersion, as in claim 10.

The Surface Is Covered By A First Layer Of Dry Corrosion Inhibiting Coating Made Of An Epoxy Resin Containing Particles Of Zn

Fukui et al. suggests the possibility of providing two layers only with reference to a particular embodiment that is referred to in col. 3, lines 45-52 However, such an embodiment is not tested, and no Table refer to such a structure. The first layer, a metal plating, is merely said to be made of any soft metal (Cu, Zn, Sn, Pb) and the second layer is merely said to be made of Cr, Mo, Tu or alloys thereof. There is no mention about the feature that the first layer should be of a dry corrosion inhibiting coating. Moreover, claim 1, as amended, further emphasizes that the first corrosion inhibiting coating layer is to be made of an epoxy resin containing particles of Zn.

Table 6 of Fukui et al. suggests that an epoxy resin could be mixed with MoS2, but no mention is made about the advantage of incorporating Zn particles mixed into an epoxy resin. Likewise no mention is made within Fukui et al. that a first layer should include the novel feature of reducing corrosion.

The present disclosure emphasized that a first layer is to be laid upon the thread for corrosion resistance. By contrast, Fukui et al. instead teaches a Zn metal plating step, that might possibly offer corrosion inhibiting properties as a first layer. However, plating a metal thread with a metal layer is a much more complex and expensive process than coating a metal thread with an epoxy resin layer.

A layer made of epoxy resin mixed with Zn particles actually creates a double advantage, in that it protects the metal of the pipe by:

i) isolating it with respect to corrosive media due to the continuous phase of an epoxy resin and

ii) inhibiting corrosion due to a discontinous phase of Zn particles.

The Threaded Portion Of The Joint Has A Specific Roughness Of 2,0 To 6,0 Microns And Is Coated By A First Uniform Layer Of A Dry Corrosion Inhibiting Coating Made Of An Epoxy Resin Containing Particles Of Zn And A Second Uniform Layer of Dry Lubricant

Fukui et al. teaches specifically that a coating is to be provided only in a non-threaded portion, where a metal seal is to be created (col. 3, lines 18-19, col. 4, lines 60-62, col. 7, lines 52-55). By contrast, the coating of a threaded portion is a significant feature of claim 1, and one that is particularly pointed out and distinctly claimed only by Applicants.

If a coating is to be laid only in a non-threaded portion of a connection, as is taught by Fukui et al., it follows to one of ordinary skill that some kind of lubricant (grease, oil, etc) must still be applied to the threads, in order to assemble the connection. This stands as a remarkable difference to a major advantage of our claimed invention, in which the connection is to be assembled without applying any lubricant on the threaded part. The presence of applied dope on the threads generates unwanted pressure during making up of the joint, which is one of the problems the inventors taught about as being avoided by their invention.

It is apparent that the Fukui et al., disclosure does not at all anticipate the claim 1 invention, and further that the advantages described in the present invention cannot at all be achieved by following Fukui et al. The three limitations of claims 1 as highlighted and discussed above cannot be found in combination in Fukui et al., and claims 1, and dependent claims 3-9, and 12 -16 are in fact both novel and non-obvious.

A Metal Surface of the Threaded End Portion Joint Has A Specific Roughness Of 2,0 To 6,0 Microns And Is Coated By One Uniform Layer Made Of A Dry Corrosion Inhibiting Coating Containing A Dispersion of Particles of Solid Lubricant

In Fukui et al., a threaded end portion is not covered with a surface protection as highlighted above, and required by independent claim 10. Instead Fukui et al., teaches that only a thread-free lip forming a metal-metal seal is to be coated.

Fukui et al. does not at all disclose the embodiment of claim 10, having one uniform layer with combined "dry lubricant and dry corrosion protection" proprieties. There is no anticipation of claim 10 and dependent claim 11 also for the reasons that Fukui et al., does not disclose the following technical features:

In Fukui et al., the metal surface of the thread-free lip is said to have a surface roughness (Ra) comprised between 5,0 μm and 25,0 μm, (see col. 8, lines 9-11). In Fukui et al., there is no mention about any required roughness of a threaded portion.

Fukui et al., does not teach that the surface protection should be constituted by one uniform layer made of a dry corrosion inhibiting coating. Instead Fukui et al., refers to a galling-resistant layer, prepared by a composite plating containing solid lubricant particles (see col. 3, lines 34-38).

The Examiner has not posited rejections of any of claims 1-16 based upon alleged obviousness, under 35 U.S.C. § 103. Nonetheless, Applicants wish to point out the following additional facts that show surprising and unexpected results from the claimed inventions.

The present invention categorically is meant for a dopeless environment, meaning that the connection is to be assembled without applying any fluid

lubricant or dope. Manifestly, the teachings of Fukui et al. have nothing to do with making a dopeless joint, since any coating covers only non-threaded parts of the connection. Instead, the Fukui et al. disclosure focuses simply on a coating that will provide enhanced galling resistance at the metal-to-metal seal area of a connection, that will still need to be assembled using dope.

Likewise, no mention is made in Fukui et al. about the presence of an anti-corrosion coating and about any critical values of surface roughness on the threads. Fukui et al. presents some test results in which several values of surface roughness and coatings are noted. However, in the present disclosure Applicants present a specific range for surface roughness -- which is *smaller* that the range suggested in Fukui et al. -- and upon which there is to be applied a particular epoxy coating. Only applicants teach an optimum behavior for such a combination of roughness/epoxy coating.

Only hindsight could support the Examiner's stated assumption that any mentioned roughness might be effectively combined with any coating which also might be mentioned in Fukui et al. The importance of a specific combination of roughness/coating is emphasized in paragraph [0028] of the disclosure of this patent application.

Only applicants teach the advantage of a first layer as an anti corrosion protection and a second layer as a dry lubricant upon a threaded portion. Such an arrangement is neither described nor suggested in any Fukui et al embodiment, and it is not at all apparent that any two layers disclosed in Fukui et al. will even provide a corrosion protection. Any two-layer system described by Fukui is achieved by plating with a metal, which is an entirely different step than applying an epoxy resin with Zn particles.

It should be emphasized that the prior art understands that the design of a successful joint is a very complex and long process, since the load conditions which the joints must withstand in operation are so huge that even small changes in one of many technical characteristics in a threaded joint will have unexpected influences on the effectiveness of other important characteristic of the same joint. A joint is the most delicate part of a pipe string and every detail has to be carefully calibrated and combined.

This technical field is a very crowded one, as illustrated by the exemplary prior art of record in this application. Improvements to joints are generally made by changing the combinations of very few parameters: the shape, dimensions and disposition of sealing surfaces, of the thread and of the shoulders, the material which constitute the joint, the lubrication provisions.

While individual limitations recited in claims 1 or 10 might be found alone in Fukui et al., the problem addressed by Fukui et al. categorically is not the problem the claimed invention has solved. Fukui et al. aimed at improving galling resistance of a threaded joint, whereas the present invention aims at avoiding the use of dope on the joint, which previously was deemed necessary for making up a joint.

The claimed invention offers an excellent solution concerning a successful dopeless joint, which is not at all like the Fukui et al. solution concerning how to avoiding galling at a metal-metal seal. A person of ordinary skill would not be enabled to create the claimed invention by any teaching within Fukui et al.

Applicants submit that the instant application is now in condition for allowance, and an early Notice of Allowance respectfully is requested.

Applicants' undersigned attorney may be reached in our Washington, DC office by telephone at 202- 530-1010. All correspondence should be directed to our below-listed address. Any fee required to render this response timely may be charged to Deposit Acct. No. 06-1205.

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